



30% Design Progress – Public Meeting Meadowdale Beach Park and Estuary Restoration Design Project



Presented by

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Presentation Overview

- Project background
- Preferred Alternative
- Existing conditions and information gathering
- 30% design progress
 - Railroad bridge
 - Recreation
 - Habitat restoration
- Next steps



30% Design Progress

Project Background



Problem Identified

- Increased flooding events and deposition of sediments begin severely impacting park 2007 to present.
- 2007 to 2014 attempted to management via maintenance with extensive permitting



Project Objectives

- Pass sediment through the opening effectively and reduce maintenance



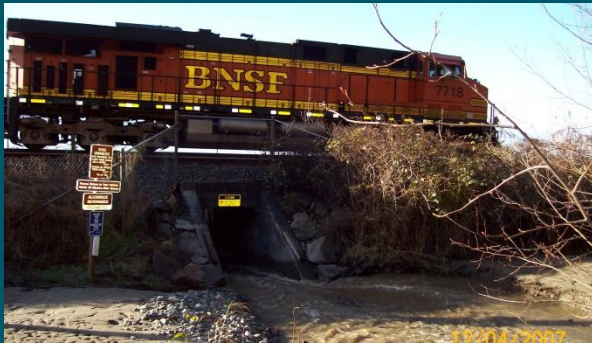
Project Objectives



- Accommodate increasing creek flows and reduce flooding events

Project Objectives

- Improve public access (including Americans with Disabilities Act [ADA] access) and safety to the beach



Project Objectives



- Enhance recreational and educational use of the park

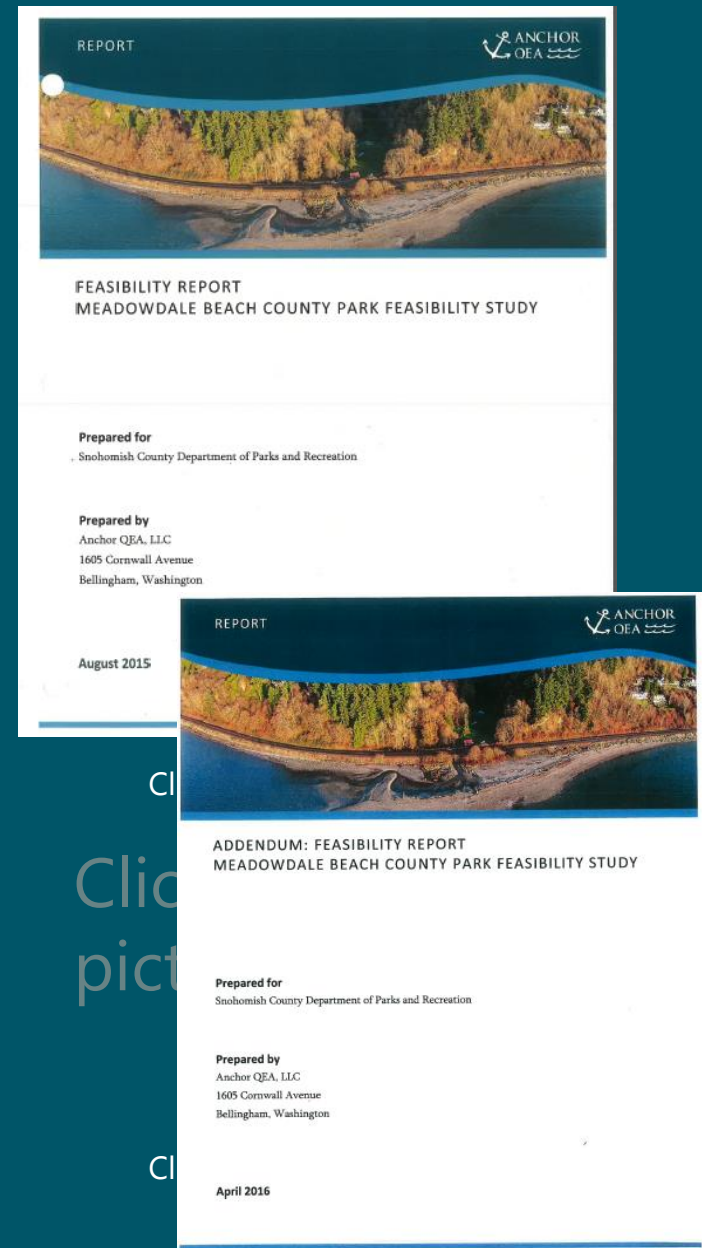
Project Objectives

- Improve fish habitat



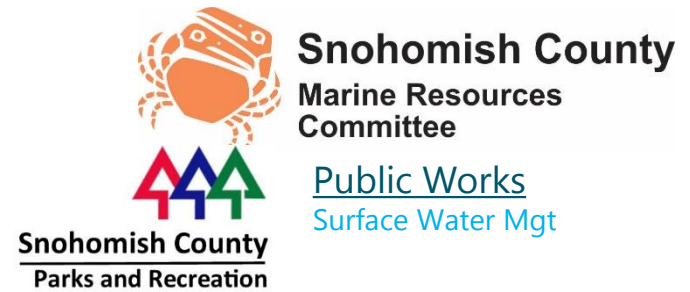
Feasibility Study 2014-2016

- Public Process including Two Community Mtgs/Two Organization Stakeholder Mtgs/Permitting Agency Mtgs
- 2007 to 2014 attempted to management via maintenance with extensive permitting
- Outcome Preferred Alternative Selection



Progress to Date

- Continues to be collaborative process with County Parks/SWM/MRC
- Hire Consultants through County RFQ process
- BNSF Preliminary Review
- Investigative Studies
 - BNSF Approval within RR right of way
- Funding Strategy Sessions

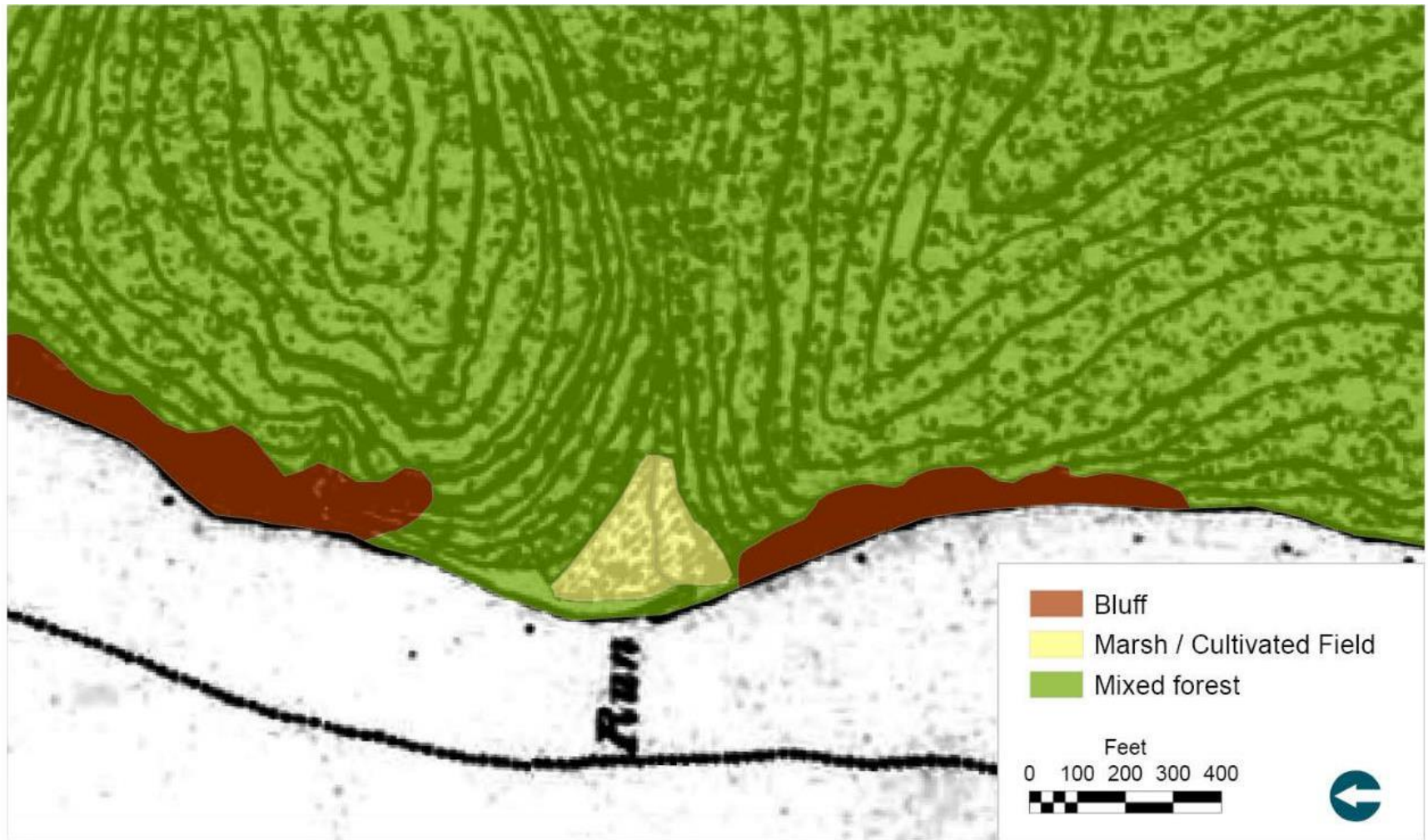


30% Design Progress

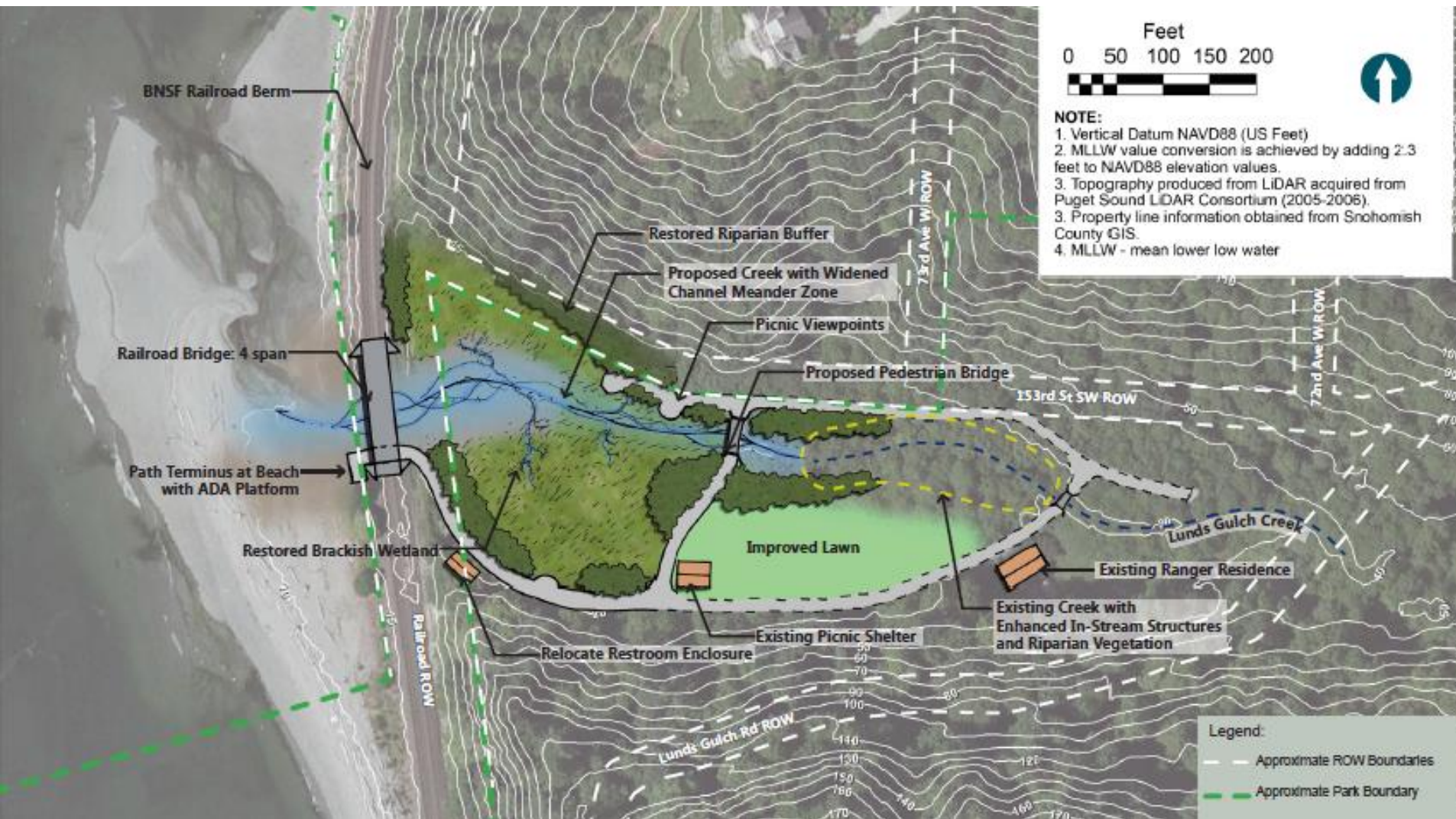
Preferred Alternative



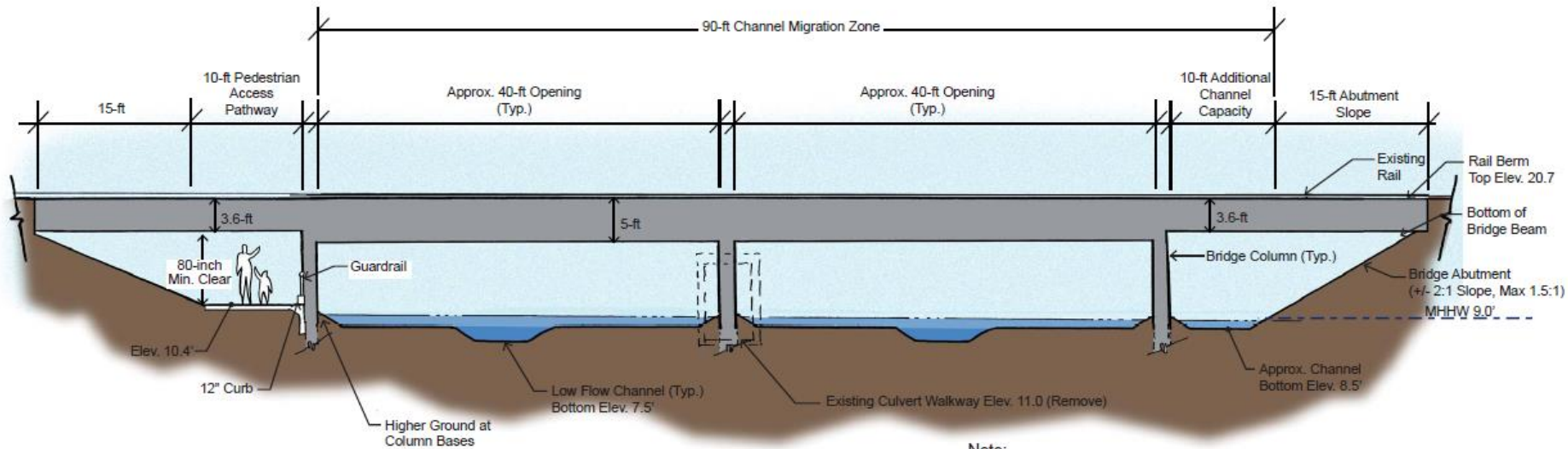
Historical Conditions: 1872 T-Sheet



Preferred Alternative: Plan Feasibility Study (2016)



Preferred Alternative: Elevation Feasibility Study (2016)



Elevation Looking West

Note:

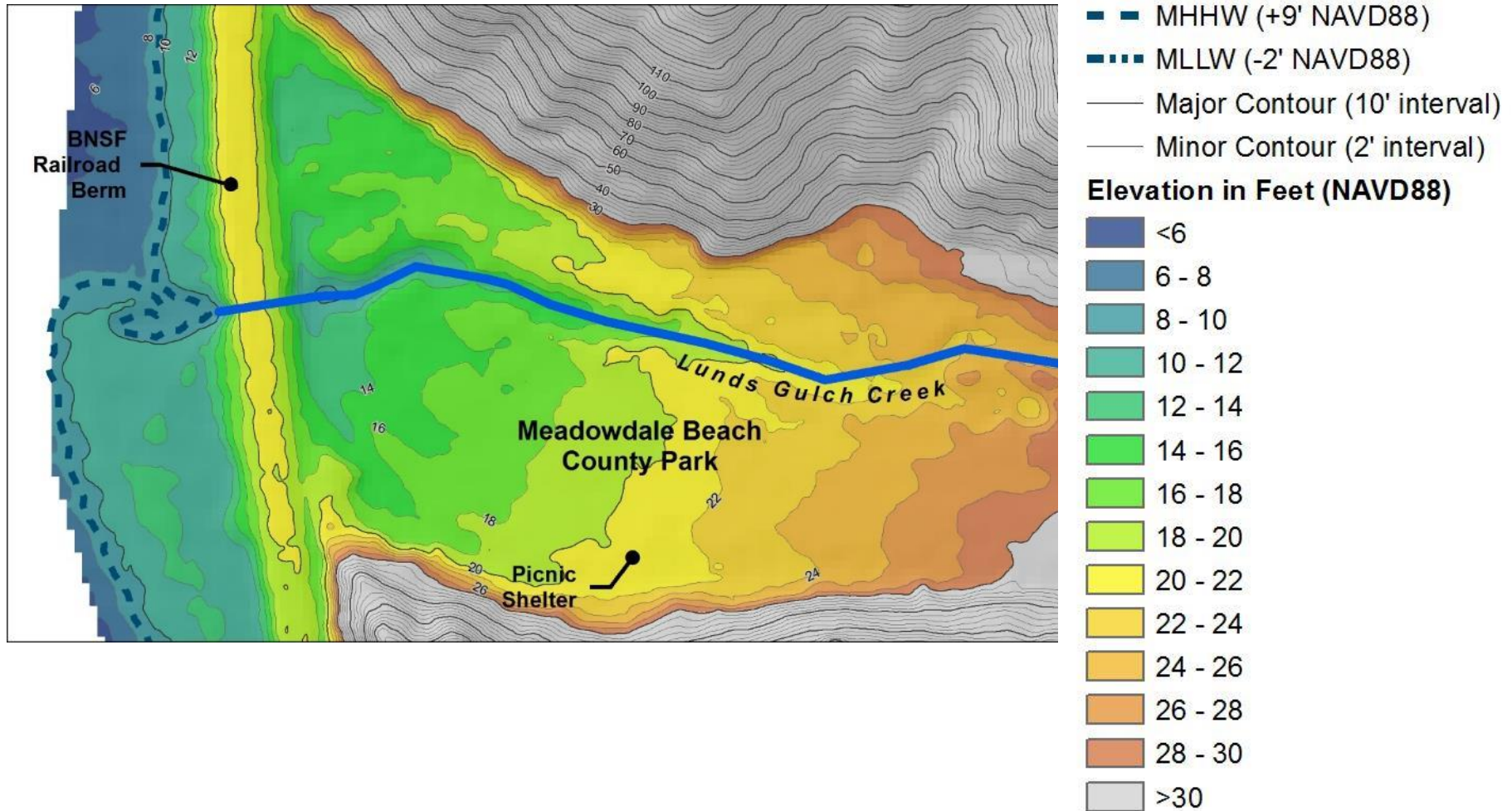
1. Vertical Datum NAVD88 (US Feet).
2. MLLW elevations can be obtained by adding 2.3 feet to NAVD88 elevation values.
3. Topography produced from LiDAR acquired from Puget Sound LiDAR Consortium (2005-2006)
4. Geometry of existing culvert taken from Puget Sound Tributaries Drainage Needs Report (Snohomish County, 2002)
5. MLLW - mean lower low water
6. MHHW - mean higher high water
7. Channel elevations shown are conceptual and may be modified based on results of hydraulic modeling or during project design.

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Existing Conditions and Information Gathering



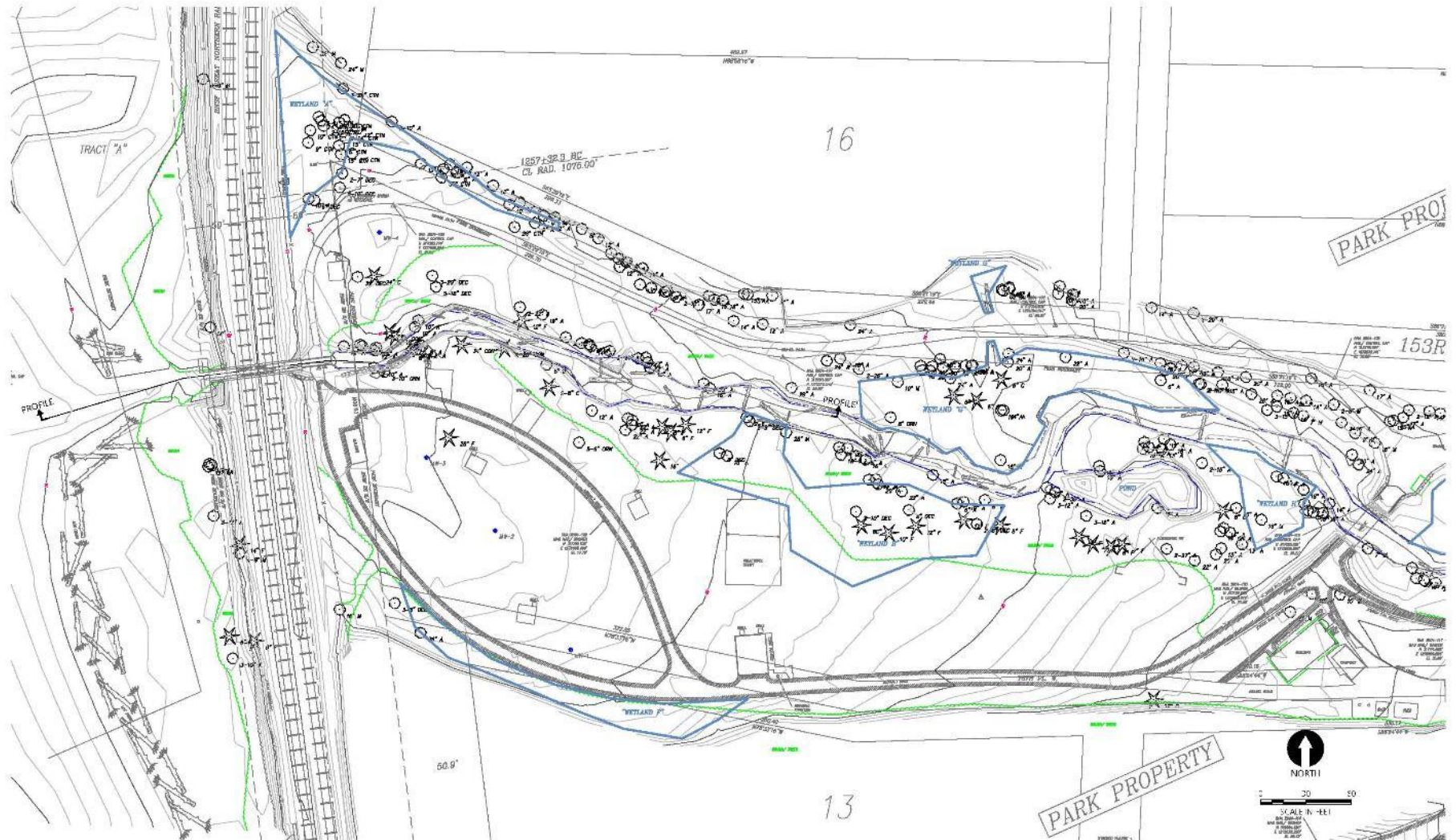
Existing Conditions: LiDAR Elevations



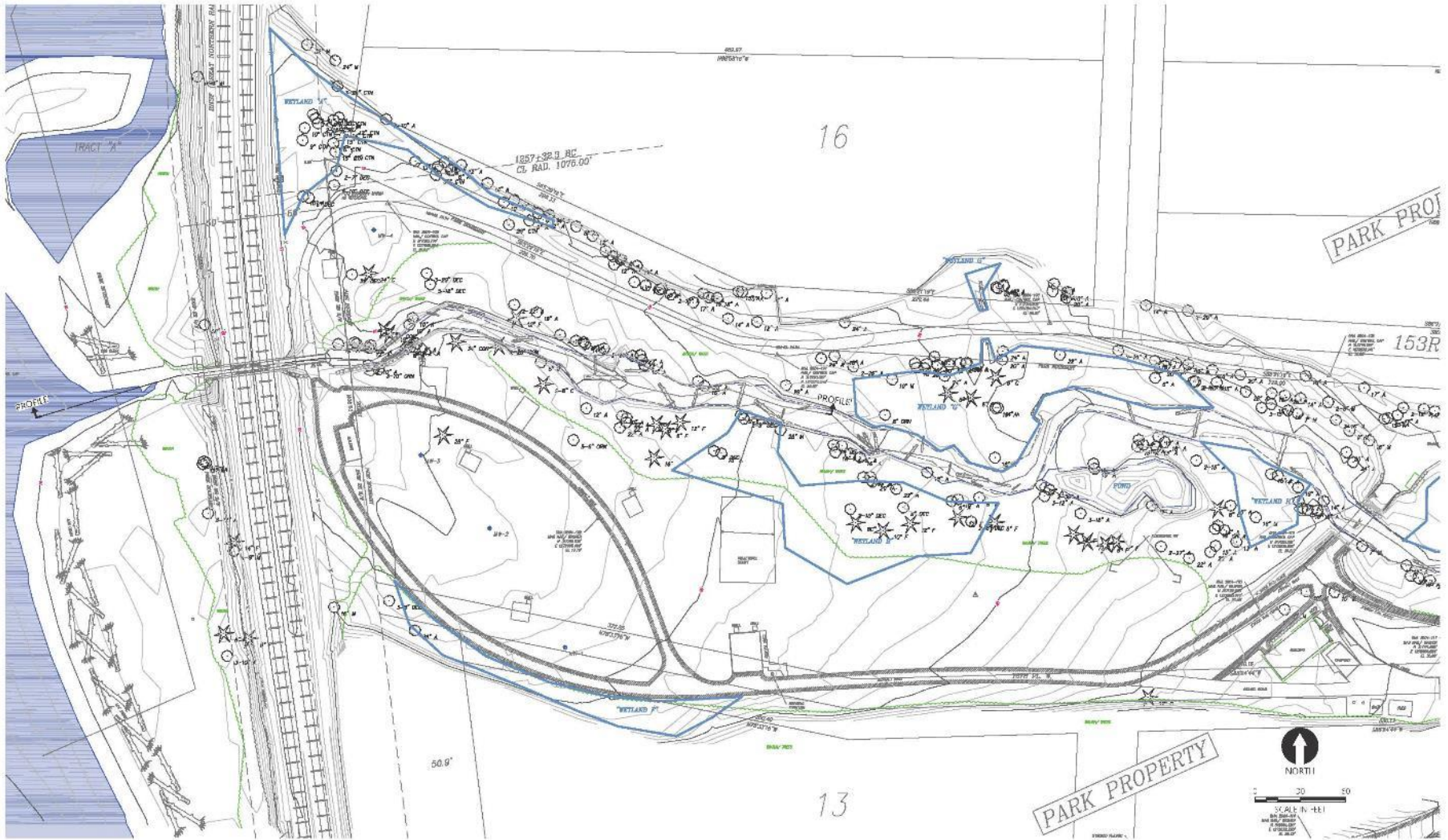
Existing Conditions: Aerial Photo

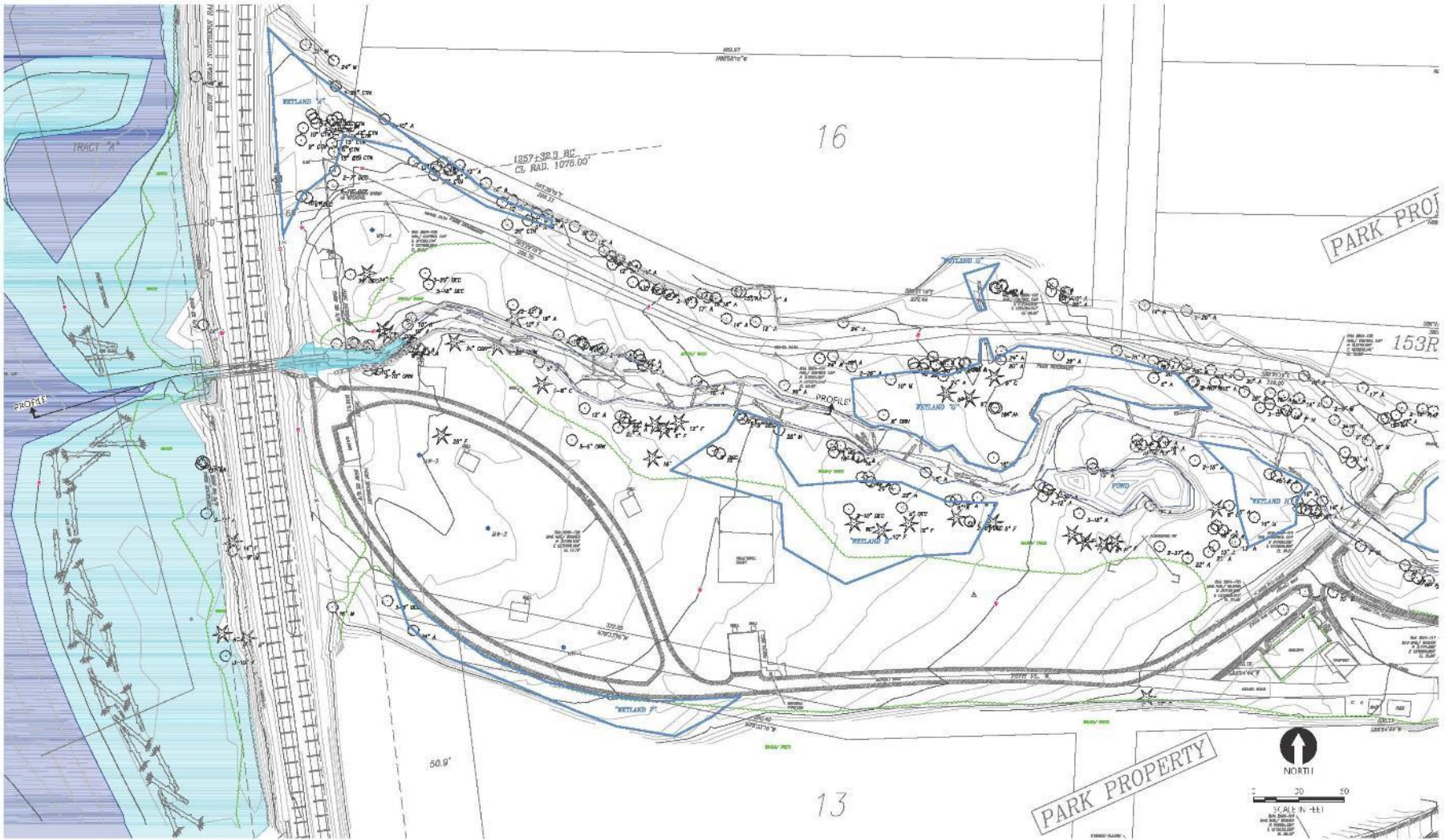


Existing Conditions: Topographic Survey



[illegible]



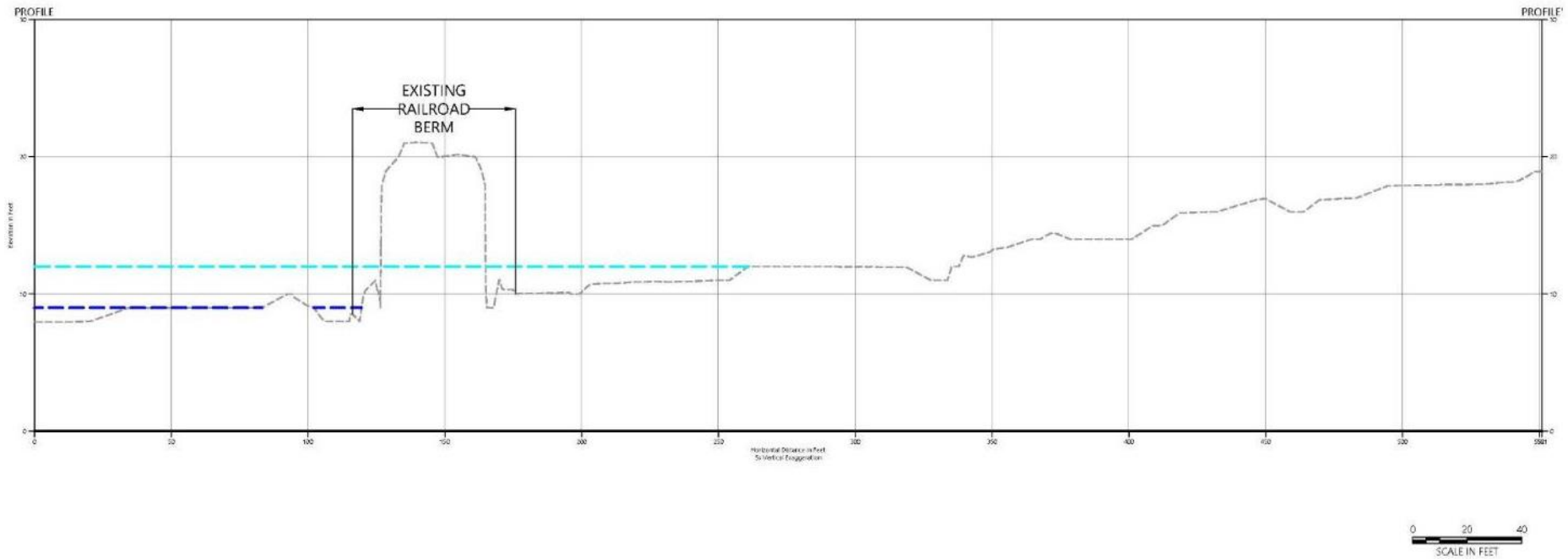


Stream Assessment

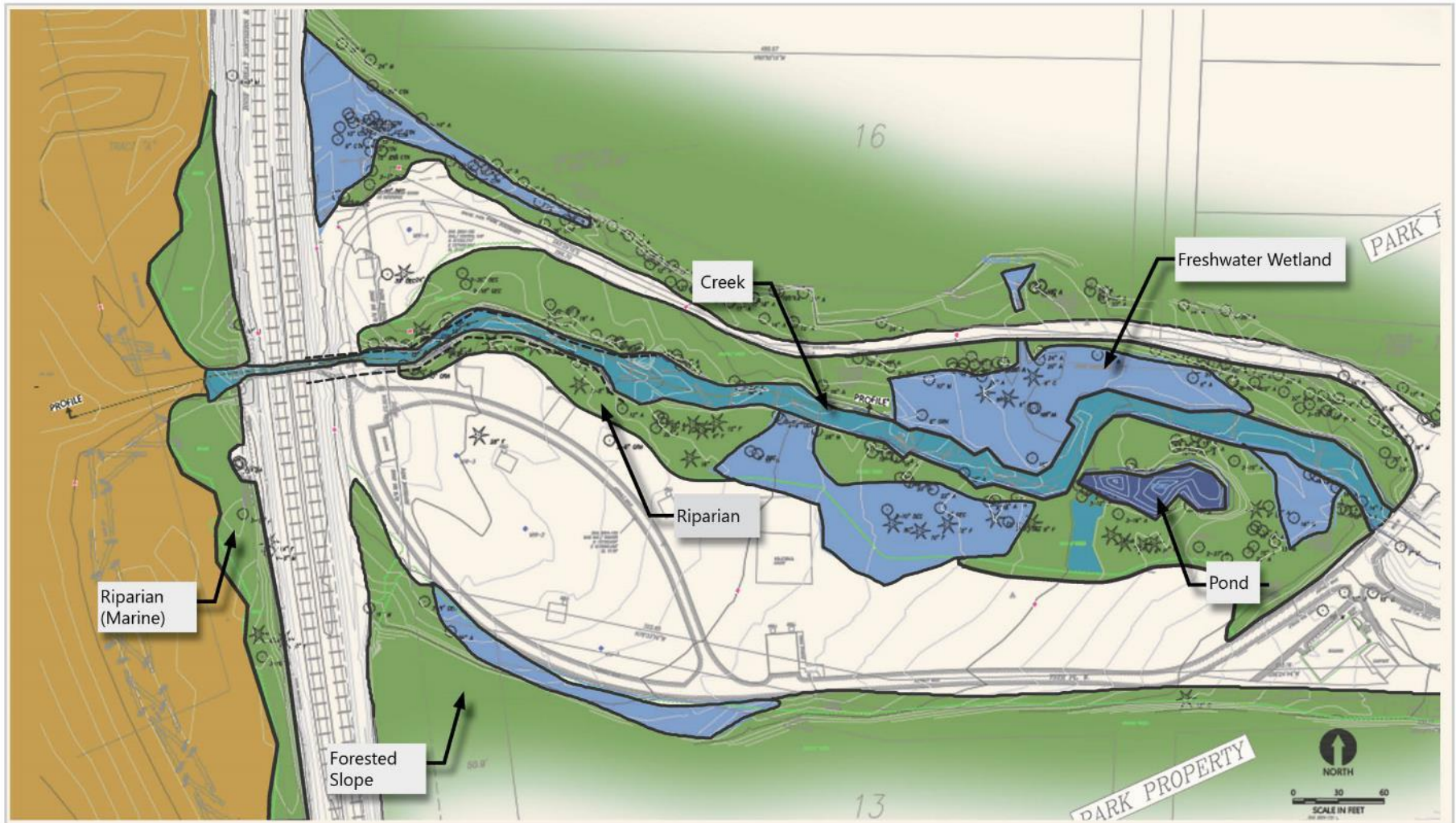
- Constrained in lower reach (restored estuary area), but better stream conditions in rest of study area
- Good habitat from wood and pools
- Excessive fine sediments limits salmon spawning conditions
- Manmade pool provides off-channel habitat
- Opportunities for improvement



Existing Conditions: Stream Profile

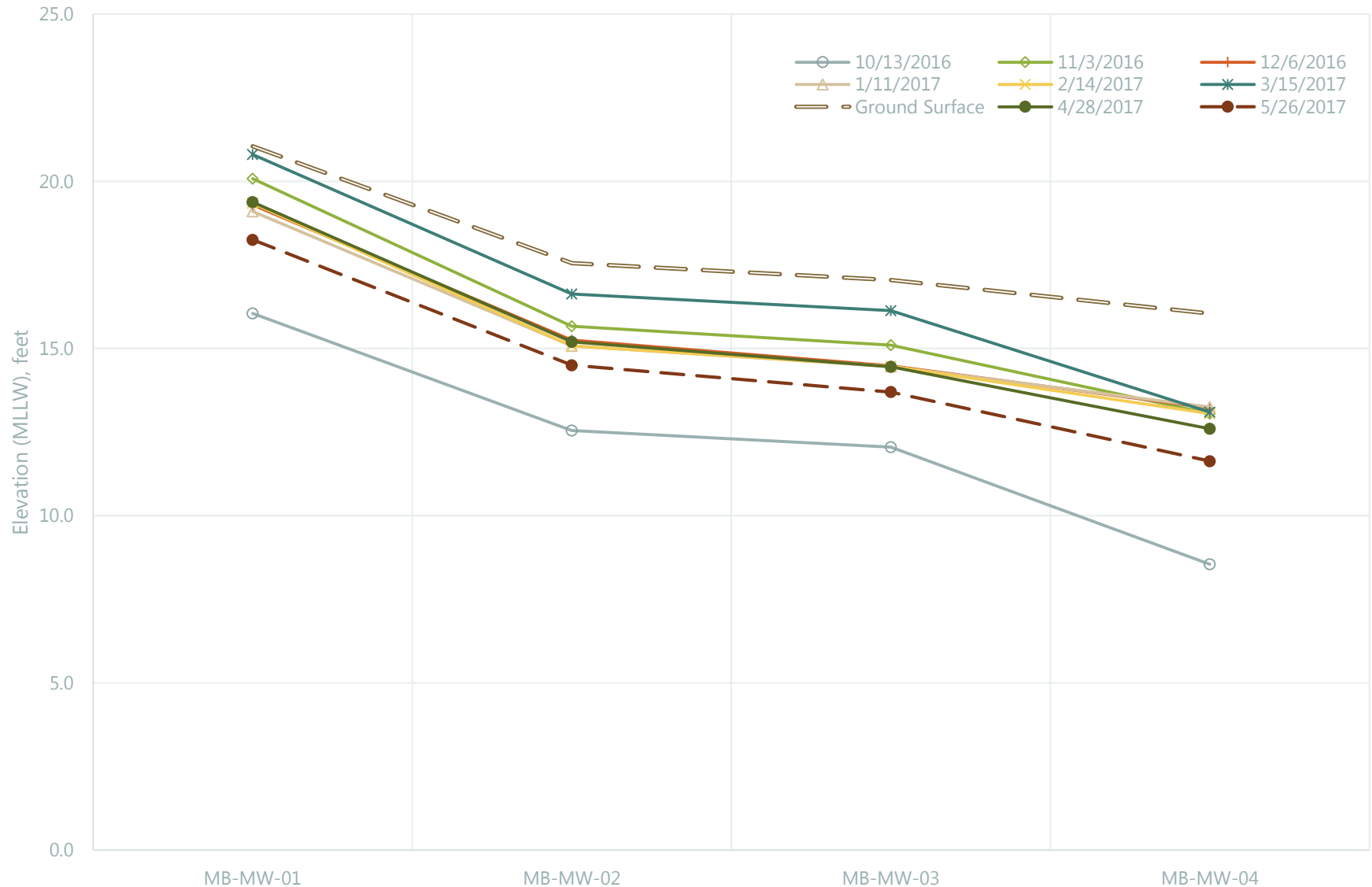


Existing Conditions: Habitat Types

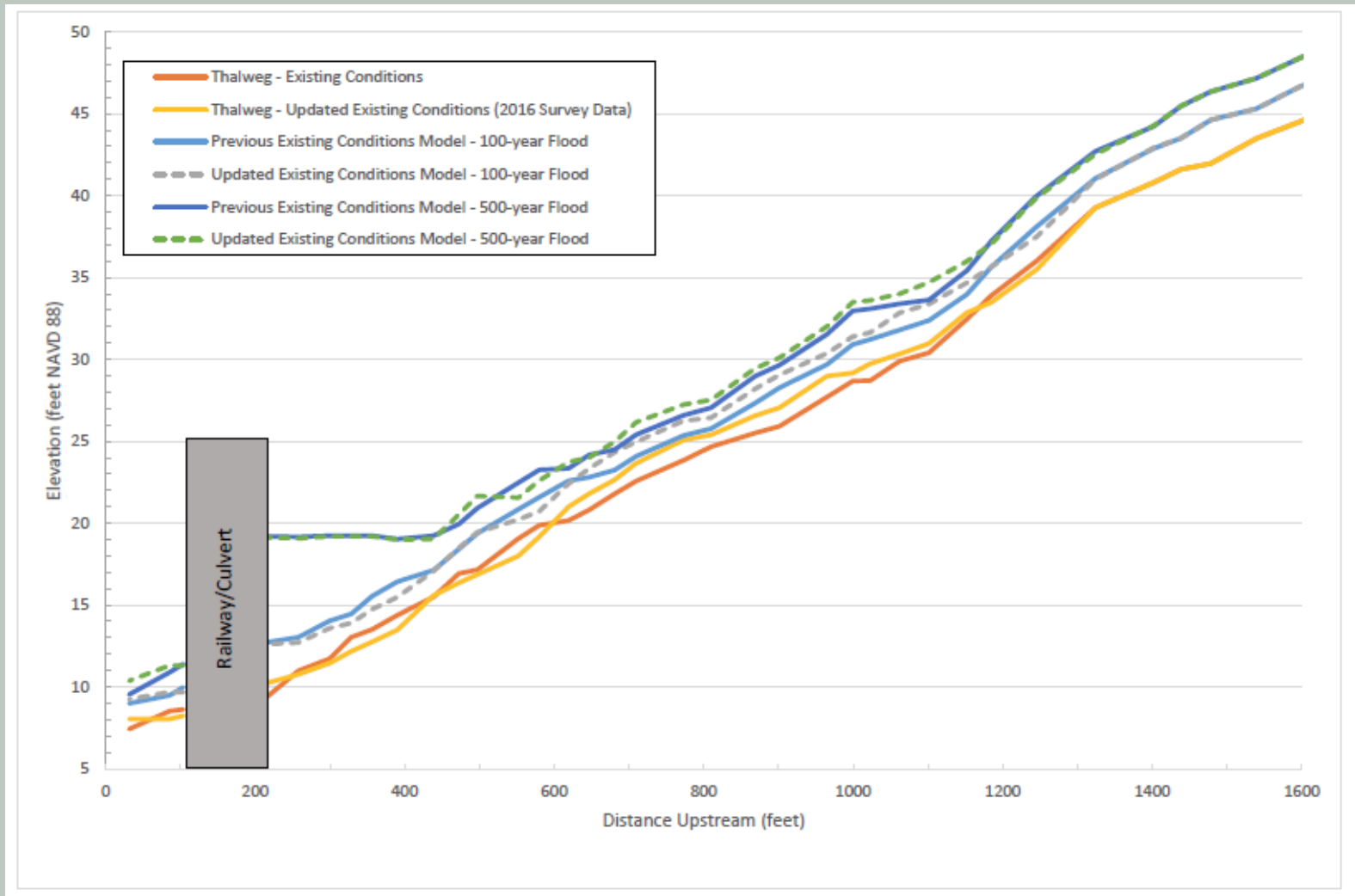


Existing Conditions: Shallow Groundwater Data

Groundwater Elevations (SE to NW)



Revised Hydraulic Model (1-D HEC-RAS)



Sediment Loading to Creek

- Estimated by Shannon & Wilson (Feasibility Study, Appendix C)
- Two mechanisms: creek bed/bank erosion and slide from above creek
- Annual average ~80 cubic yards per year
- One episodic bank erosion event in 2007 supplied ~250 cubic yards
 - Typical episodic events supply ~50 cubic yards each



Photos from Shannon & Wilson, 2014

Other Investigations

- Geotechnical
 - Railroad and pedestrian bridge vertical borings
 - Railroad horizontal borings
 - Railroad ground-penetrating radar
 - Access road evaluation and recommendations
 - Geologic hazard assessment (Critical Areas review)
- Cultural resources
 - Overall site assessment
 - Associated with borings

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Primary Plan Elements



Illustrative Plan: 30% Design Progress



30% Design Progress Railroad Bridge



A north arrow pointing upwards, labeled "NORTH". Below it is a scale bar marked from 0 to 60 feet, with the text "SCALE IN FEET" underneath.



Existing Railroad: Looking South



Existing Railroad: Looking North



128'-2" FACE-TO-FACE OF PARAPETS ~ NEW BRIDGE

2" 21'-10" 27'-10" 27'-10" 27'-10" 21'-10" 2"

P/S CONCRETE SLAB BEAM P/S CONC. DBL. CELL BOX BEAM P/S CONC. DBL. CELL BOX BEAM P/S CONC. DBL. CELL BOX BEAM P/S CONCRETE SLAB BEAM

FACE OF PARAPET END OF BEAM END OF BEAM END OF BEAM END OF BEAM END OF BEAM END OF BEAM FACE OF PARAPET

PROPOSED GROUNDLINE

HP1-2W-100 (B.S.) HP2-1W-080 (B.S.) HP2-1W-080 (B.S.) HP2-1W-080 (B.S.) HP2-1W-080 (B.S.) HP2-1W-080 (B.S.) HP2-1W-080 (B.S.) HP1-2W-100 (B.S.)

PROPOSED GROUNDLINE (-) 0.23% GRADE

PRECAST WINGWALL ~ W20-V

LOW BEAM EL. = 17.3

AT BOTTOM OF CAP

PATH EL. = 11.1

6'-0" MIN. 10'-10 1/8"

P/C CONC. BENT CAP ~ C00-1 P/C CONC. STEPPED BENT CAP ~ C10-1

CHANNEL EL. = 8.5

HP14x89# PILES, TYP.

1 1/2 12 3 1 12 3

6 5 4 3 2 1

Proposed Railroad Bridge



Proposed Railroad Bridge



BNSF Submittal Process

Phase		Type of Submittals	Format	Railroad Review Time
Design	A	Concept (Plans and Site Pictures)	PDF *	4 weeks***
	B	30% (Applicant response, Type Selection Report, Design Plan, Shoofly, Construction phasing)	PDF *	
	C	60% (Applicant response, Design Plans and Calculations, Geotechnical Report, Project Specifications and/or Special Provisions, Drainage Report and Plan, Shoofly Design, Construction phasing)	PDF *	6 weeks***
	D	Final Plans (Applicant response, Design Plans and Calculations, Geotechnical Report, Project Specifications and/or Special Provisions, Drainage Report and Plan, Shoofly Design, Construction phasing)	PDF & 1 hard copy **	4 weeks***

- Snohomish County and BNSF Contract Negotiations

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Recreation Facilities



Recreation Paths and Pedestrian Bridge



Pedestrian Bridge

Prefabricated Steel Truss Bridges

Product Information Summary	
Appearance	Semi-Customizable, Corten Rusted Steel
Lifting Weight	Estimated 12,000 lbs for 35'x8' Bridge (including wood decking)
Sustainability	High Durability, Recyclable, Non-toxic materials
Installation Time	Fast, Delivered in 1 Piece Under 70' span.
Cost	Medium, Bridge Delivered (~\$30,000), plus Installation, and Abutment
Potential Issues	Aesthetics - Need to Confirm Restroom Materials (Use of Exposed Corten Rusted Finish Steel)

Source: Contech



Prefab, Customizable

Fast Installation, More Customizable Truss and Finish Options



Prefab, Pre-engineered 'Express'

Shipment in 6-8 weeks, Installation in 1-3 days, Less Underhung Clearance

Precedent Photos



Bainbridge Island, WA



New Orleans, LA

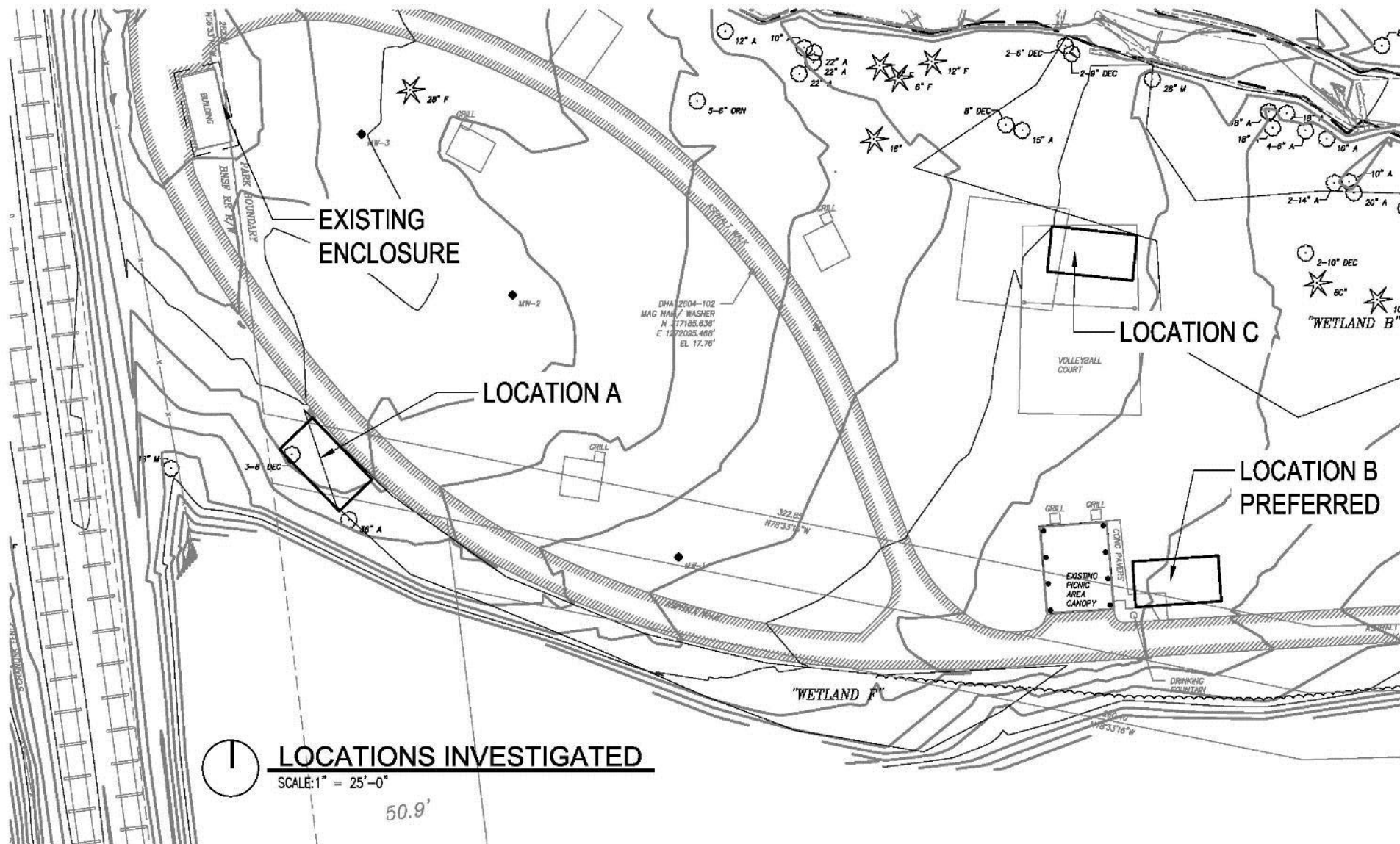


San Luis Obispo, CA

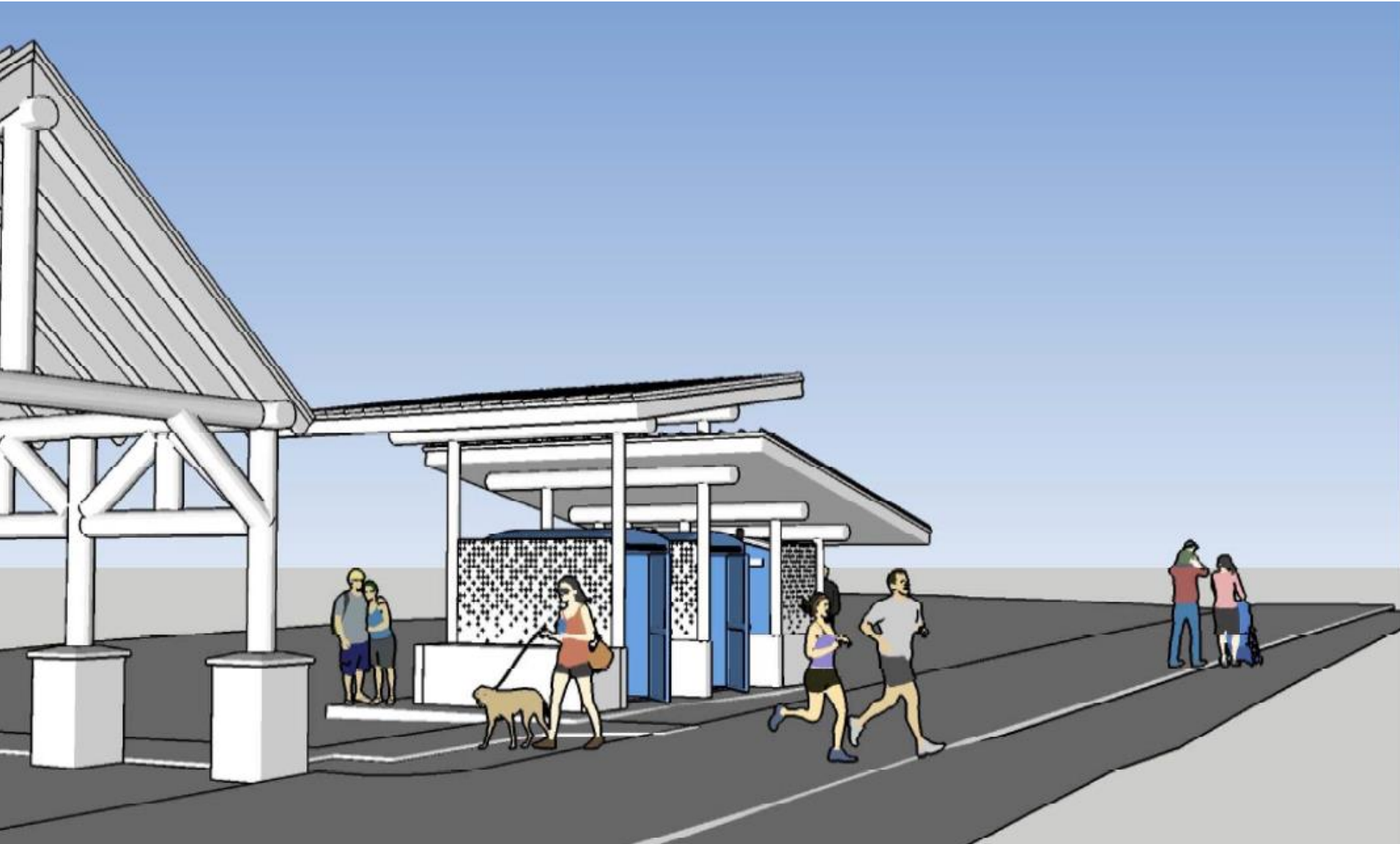
Restroom Enclosure



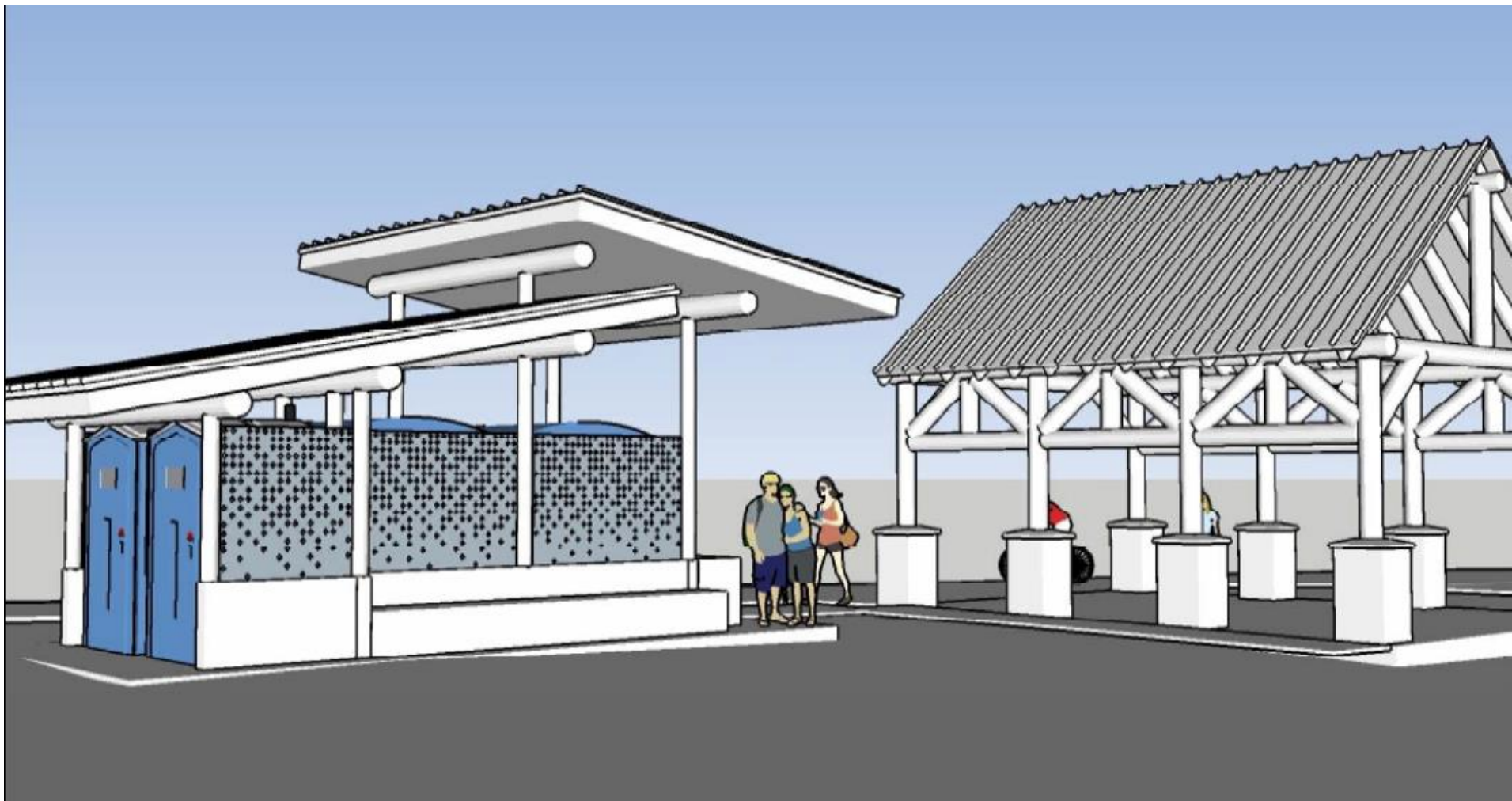
Restroom Enclosure: Locations



Restroom Enclosure-Shed Roof



Restroom Enclosure-Shed Roof



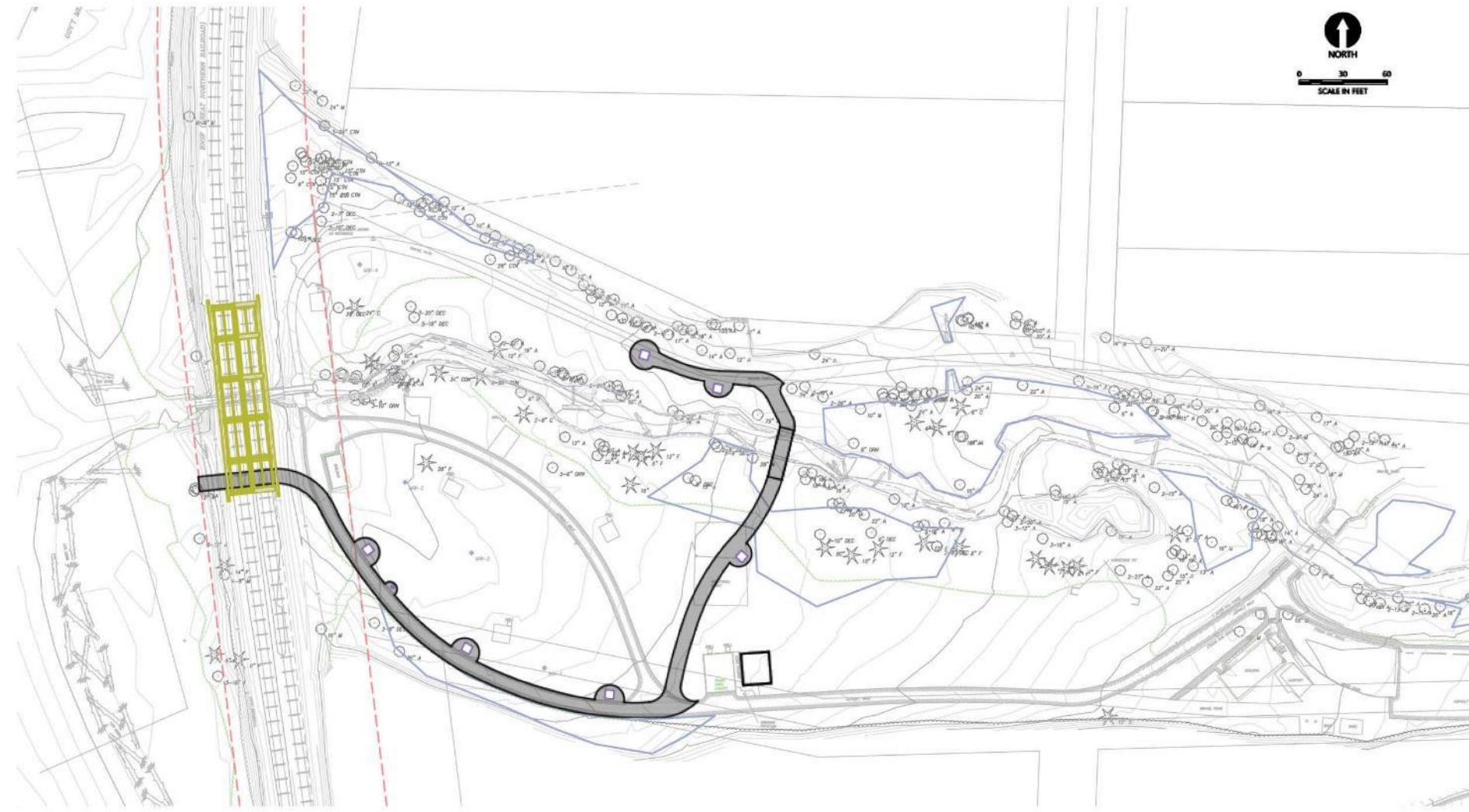
Restroom Enclosure-Gable Roof (Recommended)



Restroom Enclosure-Gable Roof (Recommended)



Site Furnishings



Picnic Tables and Site Furnishings



Picnic tables (concrete, Seahurst Park, Burien)



Foot wash, MDF



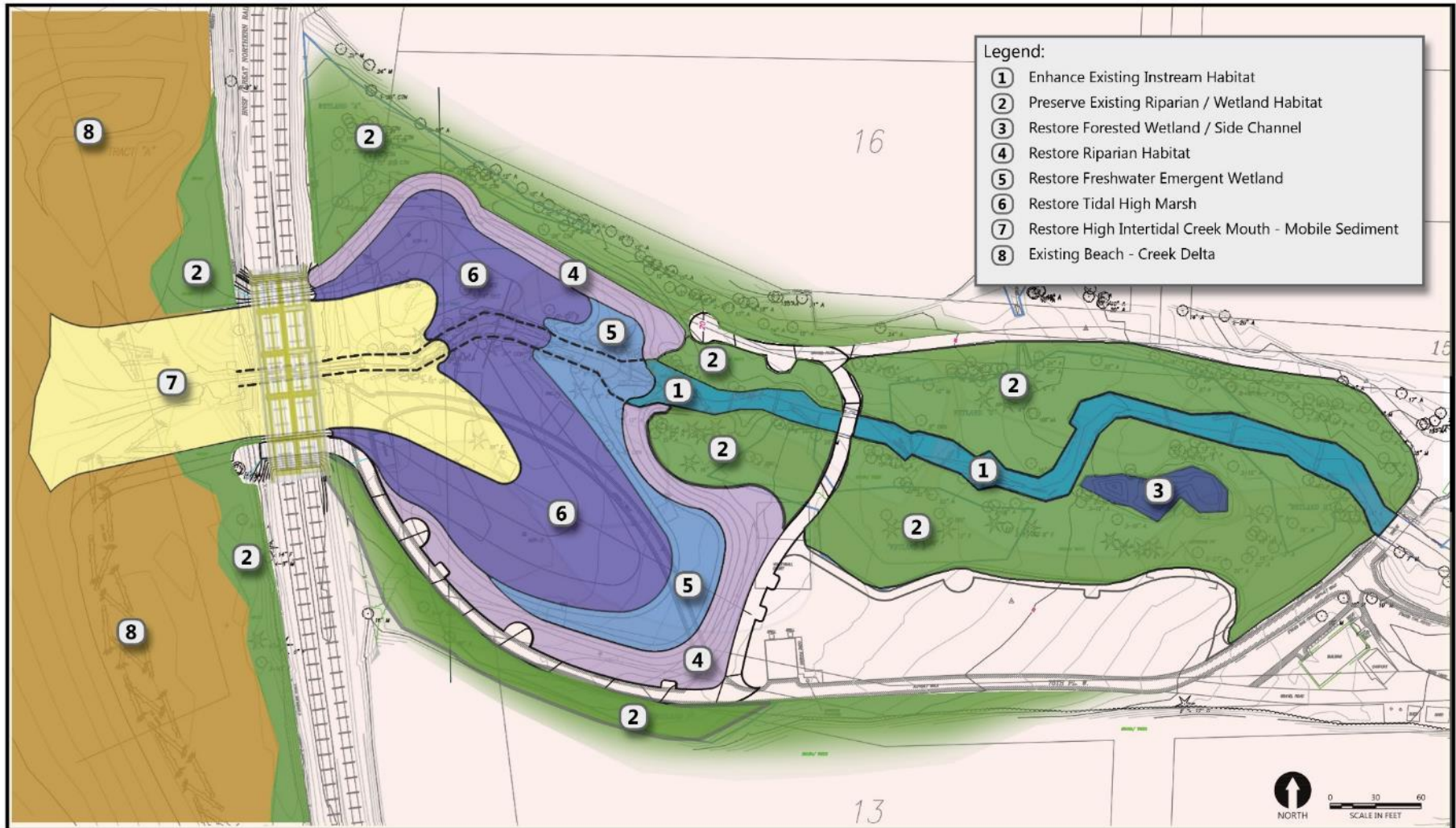
Drinking Fountain, MDF

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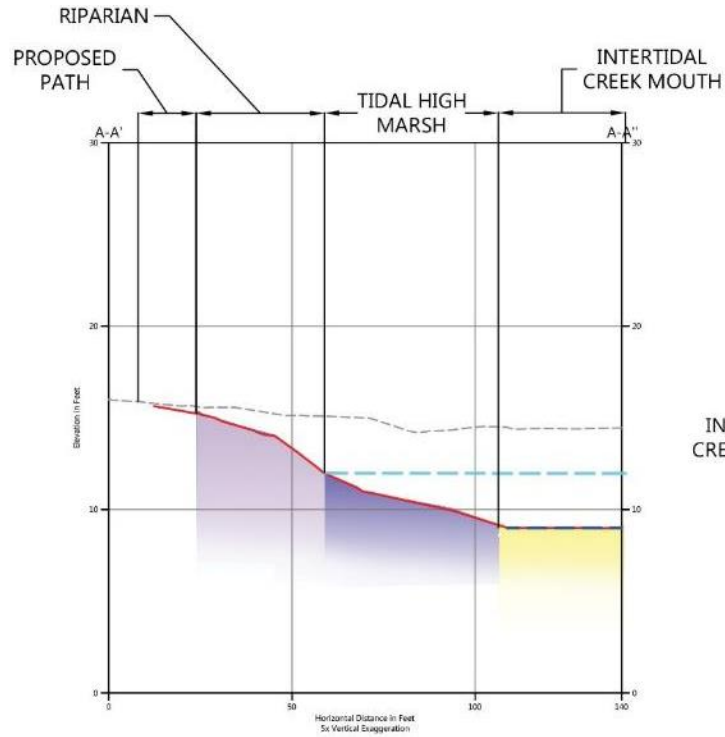
Habitat Restoration



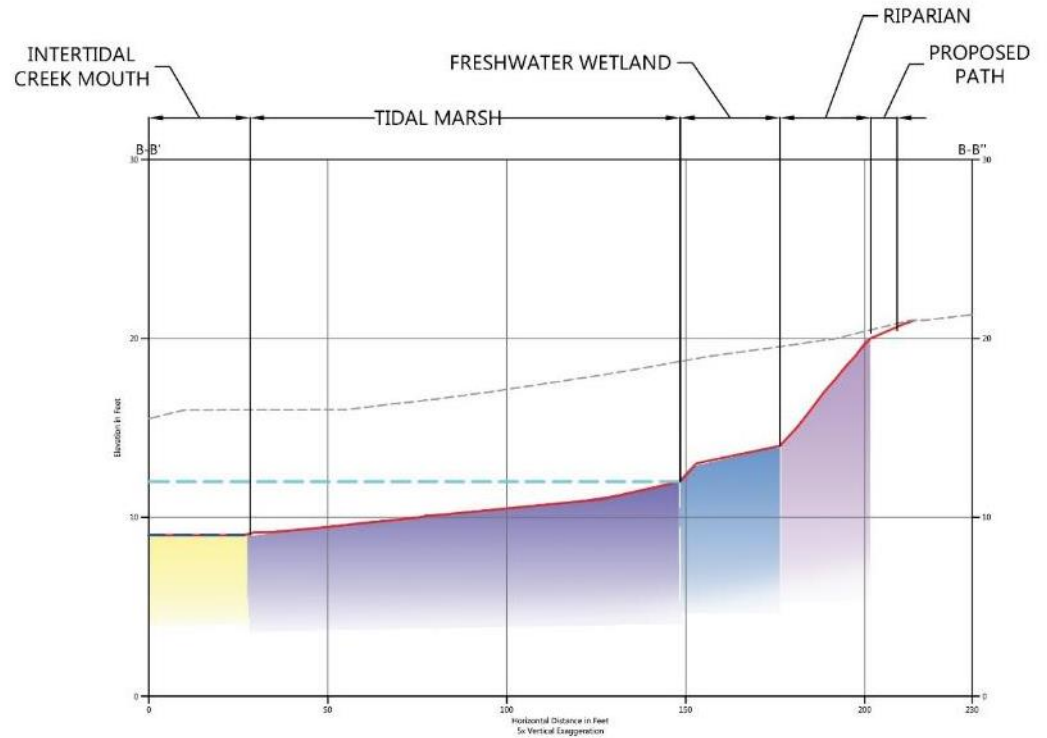
Restoration Habitat Types: Preserved/Proposed



Habitat Types: Cross-Sections



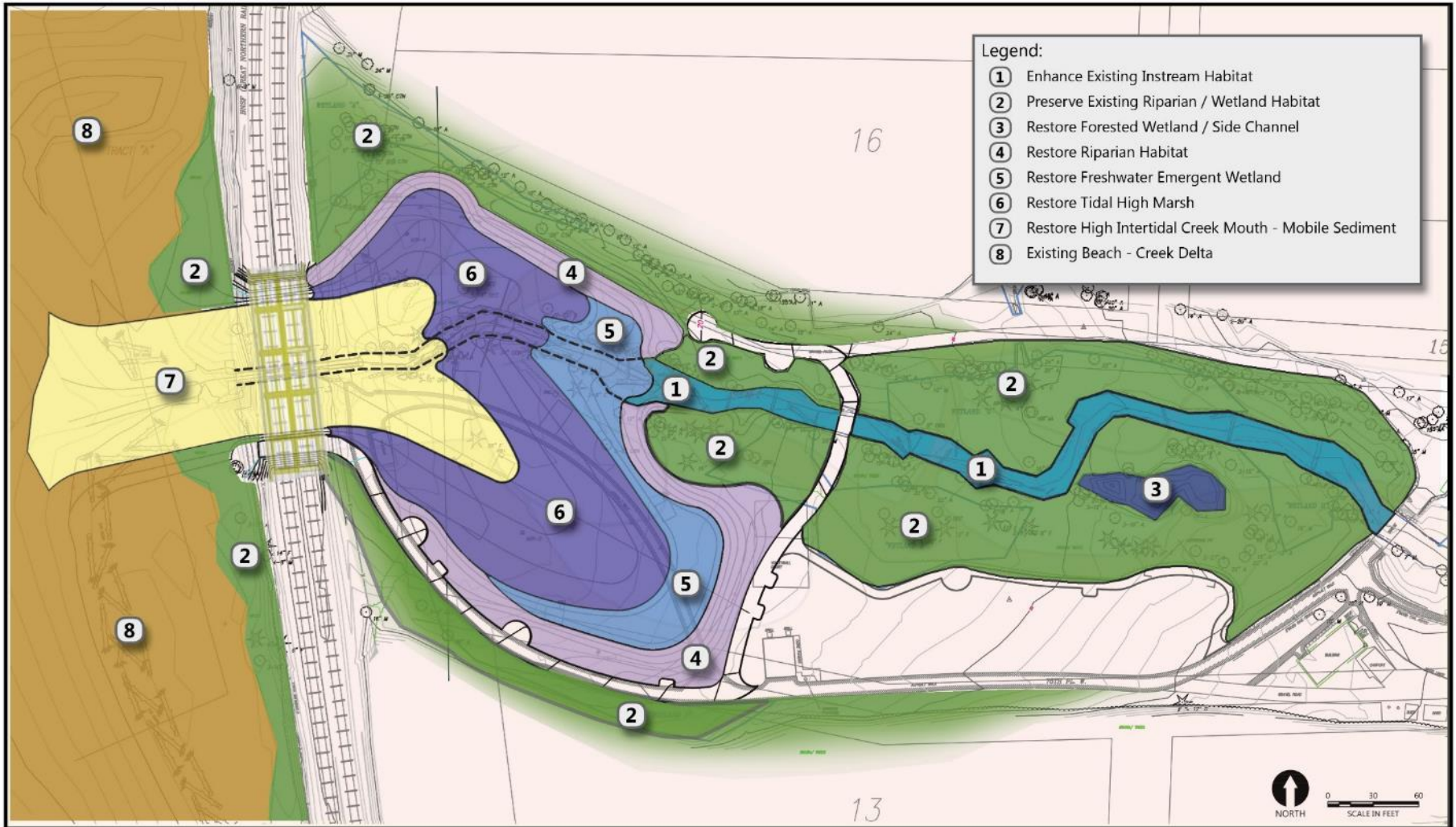
A
C-1 SECTION
SCALE: ---



B
C-1 SECTION
SCALE: ---



Habitat Types: Plant Species



Habitat Types: Representative Riparian Trees

Douglas Fir (*Pseudotsuga menziesii*)



- Type: Evergreen Conifer
- Height: Grows up to 200-ft tall

Sitka Spruce (*Picea sitchensis*)



- Type: Evergreen Conifer
- Height: Grows up to 120-ft tall

Western Redcedar (*Thuja plicata*)



- Type: Evergreen Conifer
- Height: Grows up to 150-ft tall

Big Leaf Maple (*Acer macrophyllum*)



- Type: Deciduous
- Height: Grows up to 100-ft tall

Representative Riparian Trees and Shrubs

Red Alder (*Alnus rubra*)



- Type: Deciduous
- Grows to 80'-120' tall

Common Snowberry (*Symphoricarpos albus*)



- Type: Deciduous Shrub
- Grows to 2'-5' Tall

Nootka Rose (*Rosa nutkana*)



- Type: Deciduous Shrub
- Grows to 2'-10' Tall

Salmonberry (*Rubus spectabilis*)



- Type: Deciduous Shrub
- Grows to 6' Tall

Representative Fresh and Tidal Wetland Plants

Small Fruited Bulrush (*Scirpus microcarpus*)



- Type: Herbacious / Freshwater
- Grows to 3' Tall

Hardstem Bulrush (*Schoenoplectus acutus*)



- Type: Herbacious / Freshwater
- Grows to 3'-10' Tall

American threesquare (*Scirpus americanus*)



- Type: Herbacious / Freshwater & Tidal Marsh
- Grows to 7' Tall

Tufted hairgrass (*Deschampsia cespitosa*)



- Type: Herbacious / Tidal Marsh
- Grows to 2-3' Tall

Representative Tidal Wetland and Beach

Lyngby's Sedge (*Carex lyngbyei*)



- Type: Herbacious / Tidal Marsh
- Grows to 3' Tall

Pacific Silverweed (*Potentilla anserina* ssp. *Pacifica*)



- Type: Herbacious / Tidal Marsh
- Grows to 0.5' Tall

Dunegrass (*Elymus mollis*)



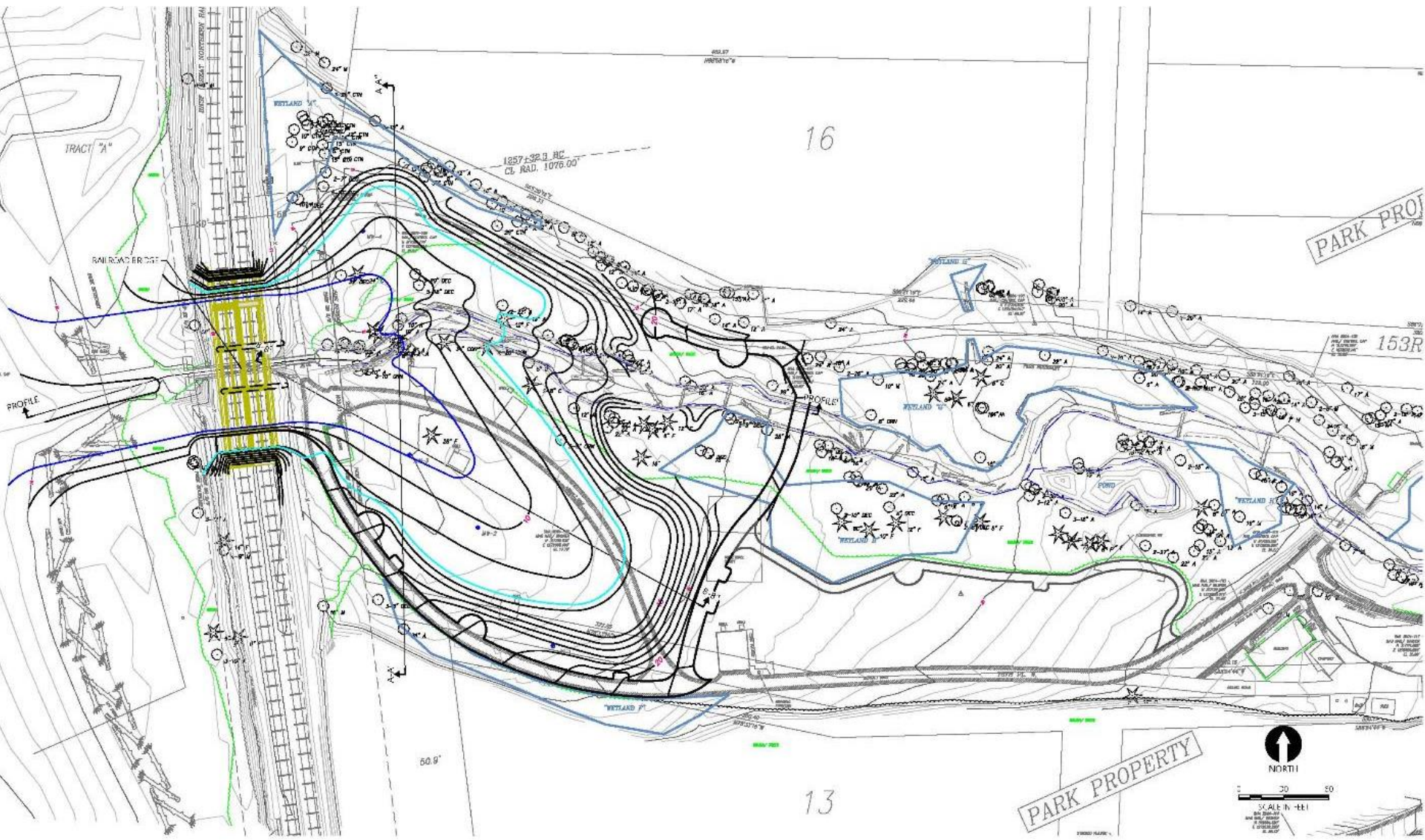
- Type: Herbacious / Beach
- Grows to 3' Tall

Puget Sound Gumweed (*Grindella integrifolia*)

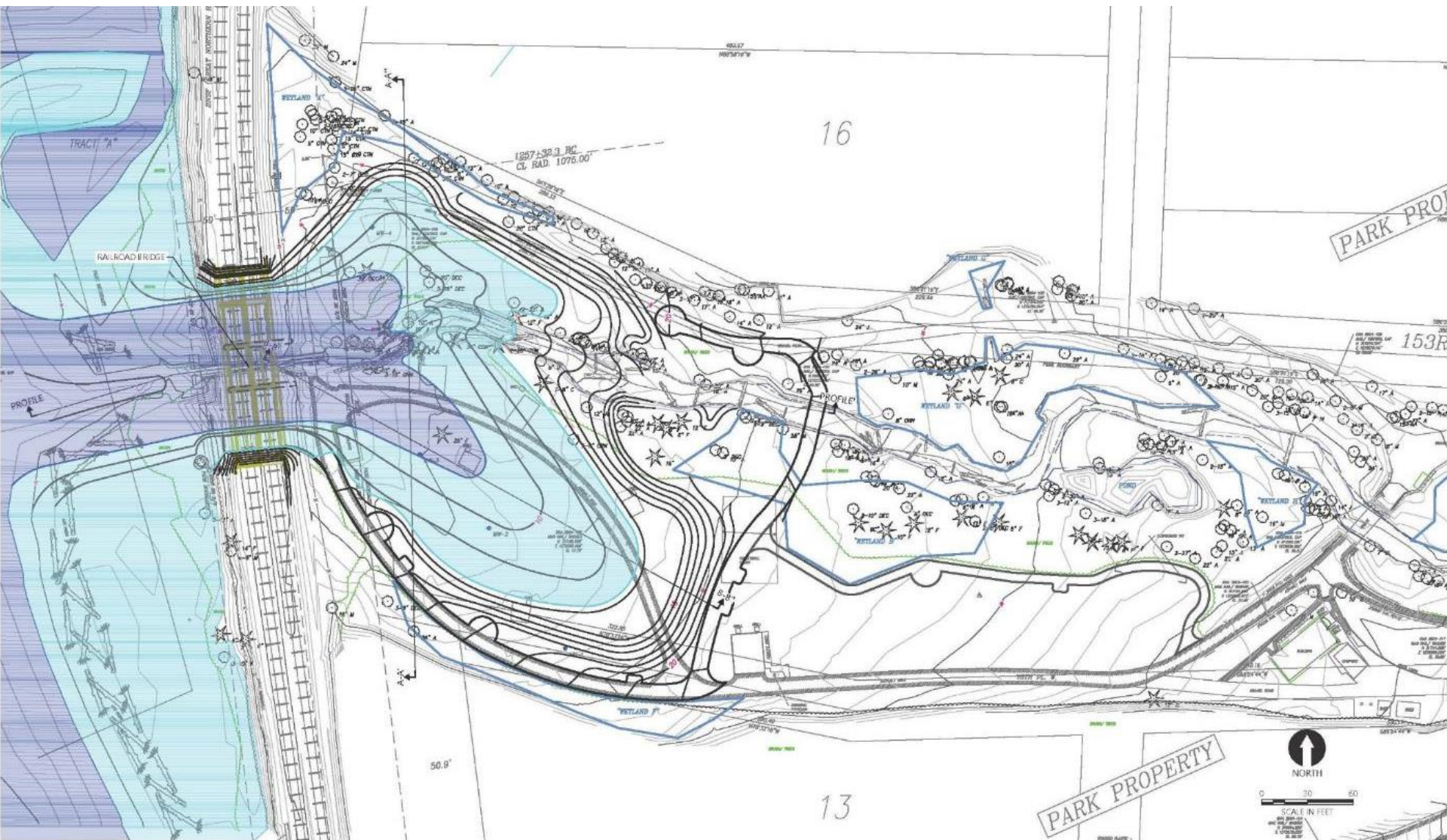


- Type: Herbacious / Beach & Tidal Marsh
- Grows to 3' Tall

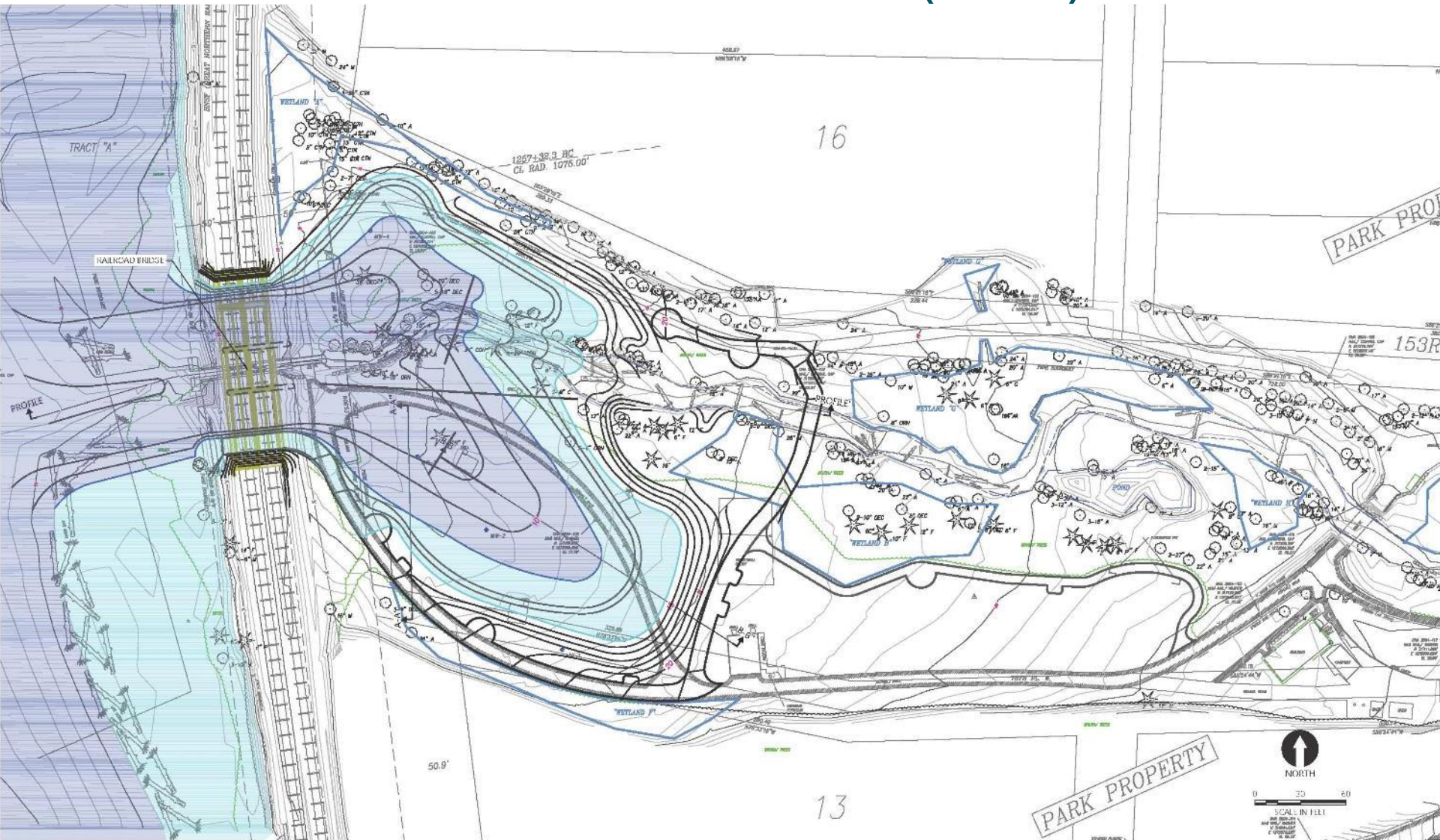
Grading Plan



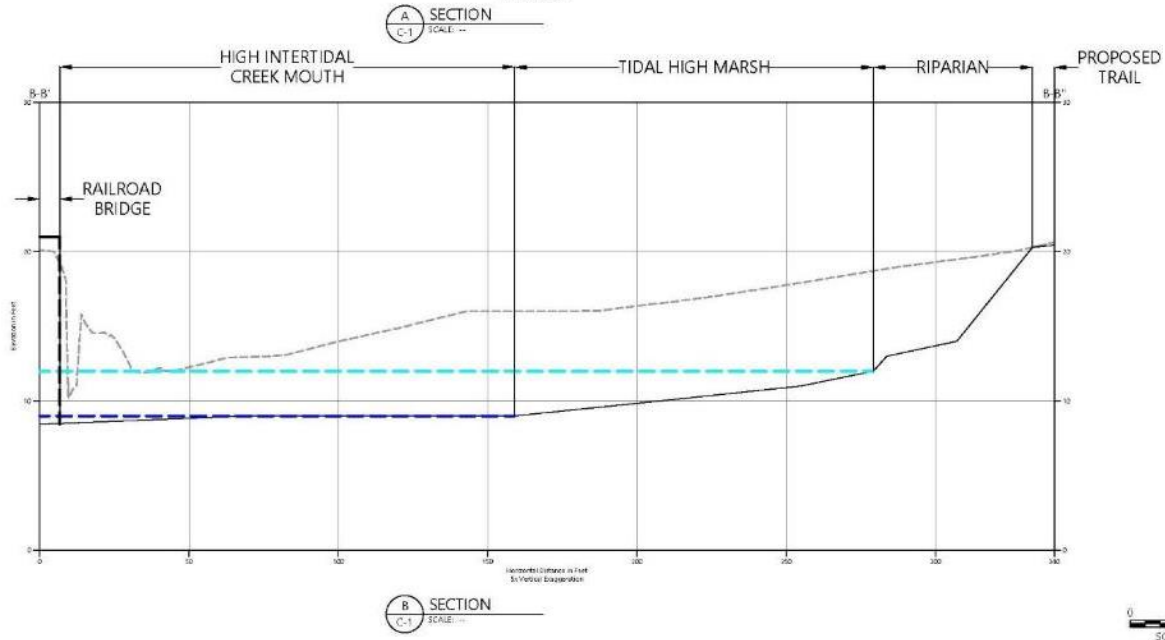
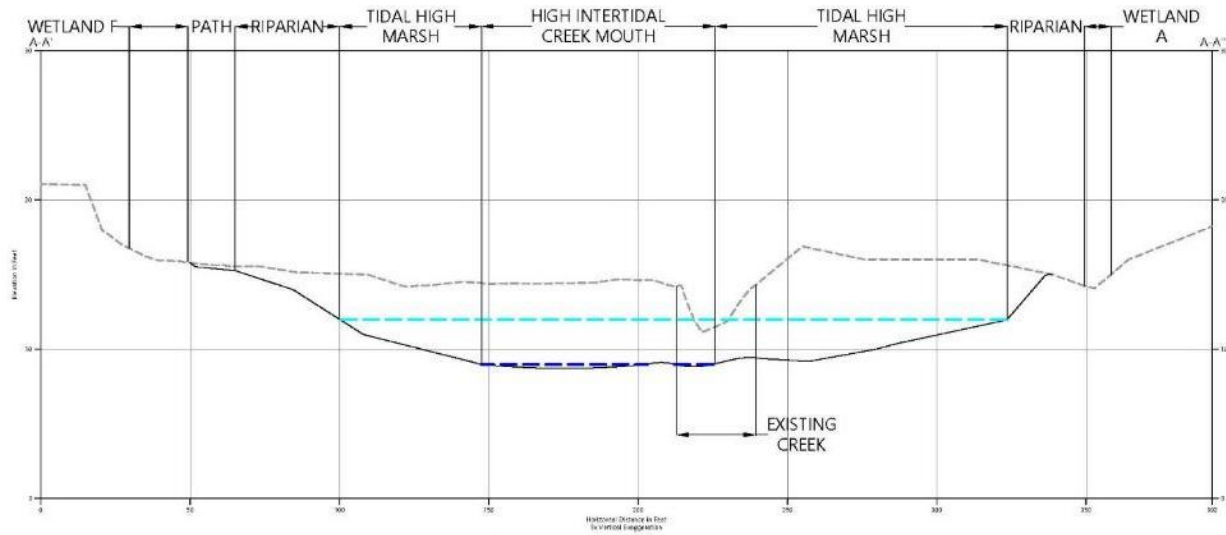
Grading and Tidal Inundation Plan: MHHW and EHW



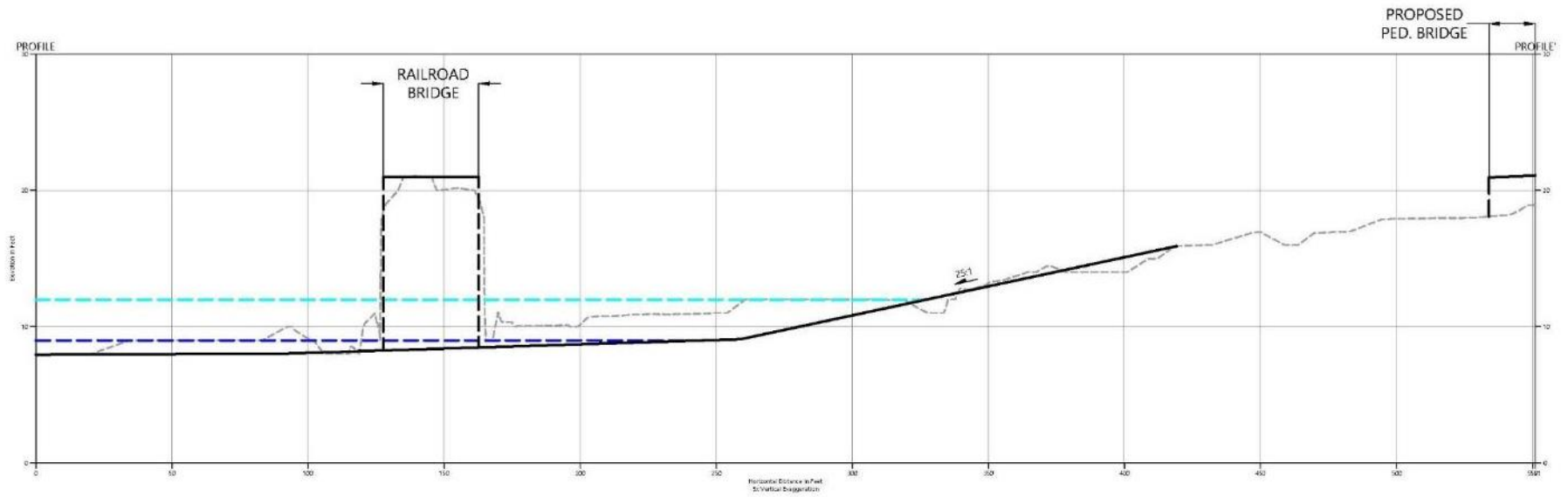
Grading and Tidal Inundation Plan: 2 Feet Sea Level Rise (2100)



Grading Sections



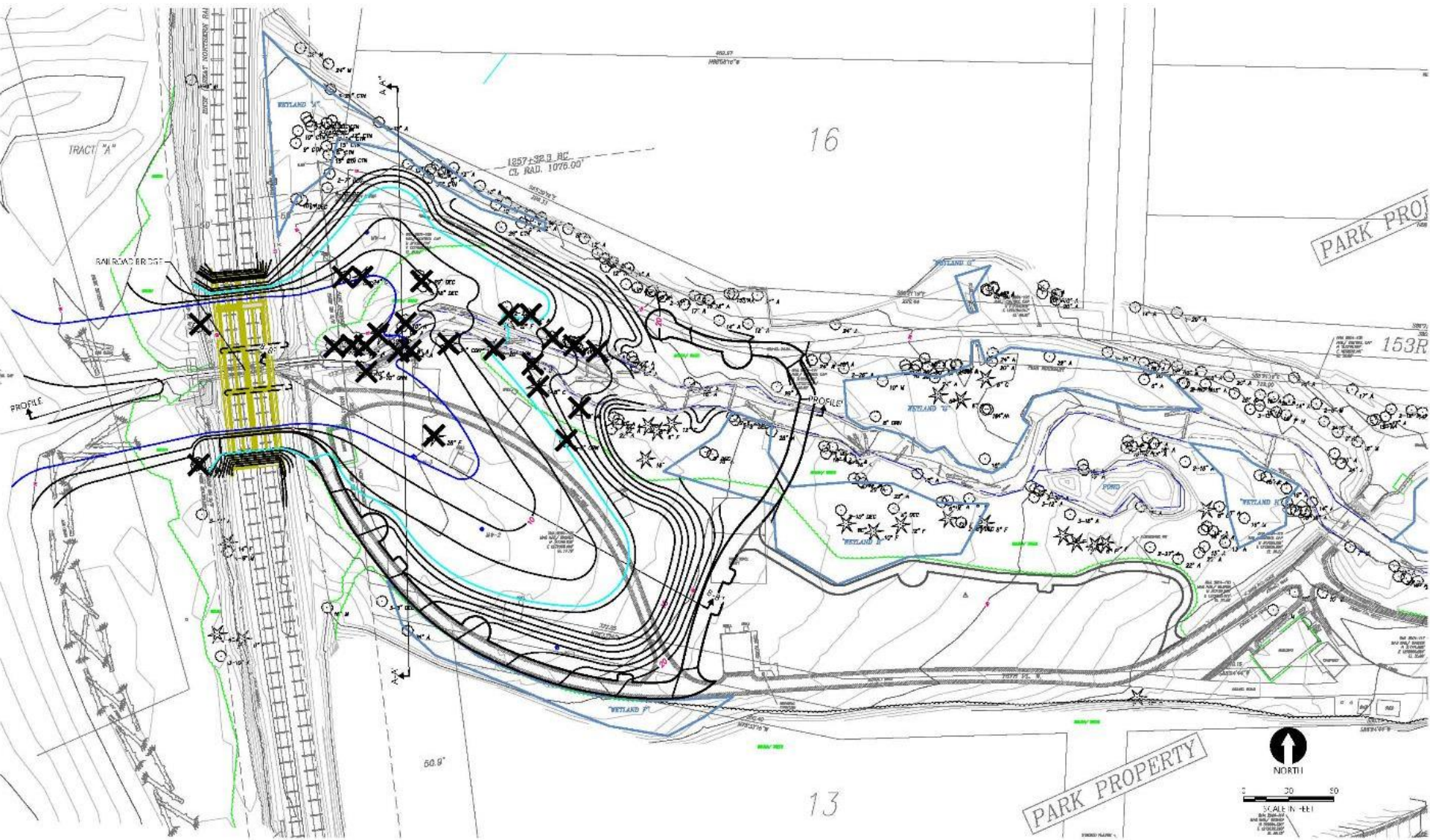
Proposed Stream Profile



C-1 STREAM PROFILE
SCALE: 1" = 40'

0 20 40
SCALE IN FEET

Proposed Tree Removal at Lower Creek



Reasons for Tree Removal

- Increase transition area from fresh to saltwater for juvenile salmon (chinook and chum)
- Create opportunity for natural habitat formation
- Provide space for sediment to deposit and for sea level rise
- Mix of native and non-native trees
- Trees will be re-used for habitat



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Next Steps

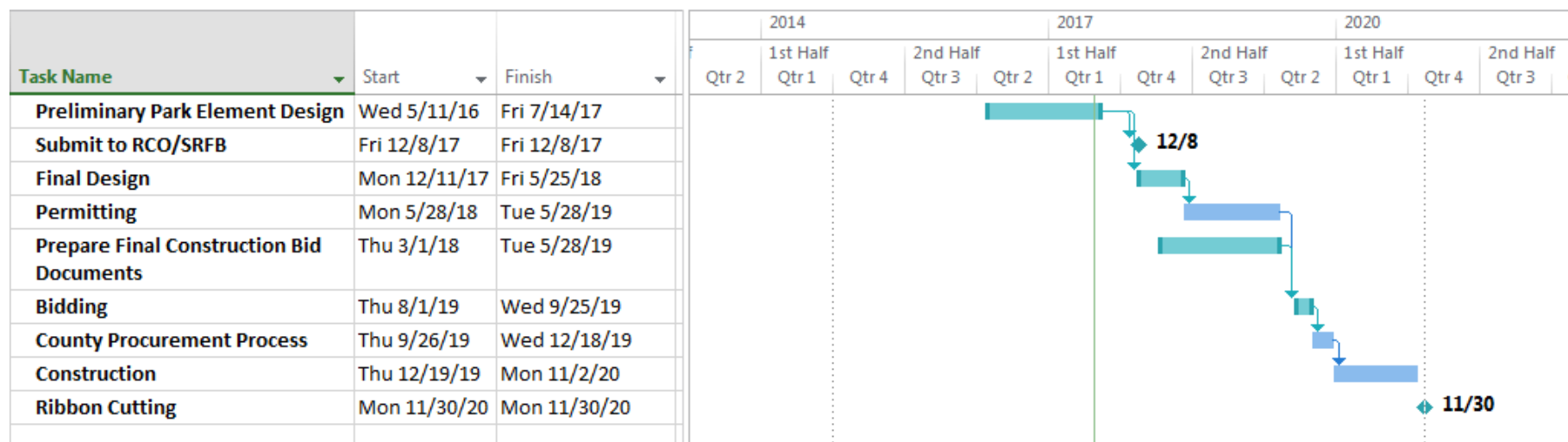


NEXT STEPS 2017

- 30% Park Element Design Submittal – July 14, 2017
- Agency/Organization Stakeholder Mtg – TBD
- 30% BNSF Submittal – August 2, 2017
- Commence County/BNSF R/W & O/M Agreement Process
- RCO/SRFB Prelim Design Submittal Dec 2017
- Meet with Grant Agencies/begin applications (Fall 2017-2018)

TENTATIVE SCHEDULE

(Dependent on Funding & Agency/BNSF Approvals)



30% Design Progress

Questions and Answer Session at Design Topic Stations



Thank You!

